GIA Environmental Health and Safety Electrical Safety Standard

DOCUMENT IDENTIFIER: A-SP-ELMF740-00-0000 Rev A, 01-Apr-1991

ABSTRACT: The purpose of this GIA standard is to define the basic elements and responsibilities for the establishment of a site Electrical Safety Program.

APPLICABILITY: This GIA standard shall apply to GIA facilities and operations worldwide, unless superseded by more stringent country and/or local regulations.

STATUS: APPROVED 01-Apr-1991; use VTX SMC for current status.

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REVISION HISTORY:	No previous revision exists.
Document Management Category:	Environmental Health and Safety (MEH)
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APPROVAL: This document has been reviewed and approved by the General Review group for its category.

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1 INTRODUCTION

The purpose of this GIA standard is to define the basic elements and responsibilities for the establishment of a site Electrical Safety Program.

1.1 SCOPE

This GIA standard shall apply to GIA facilities and operations worldwide unless superseded by more stringent country and/or local regulations.

1.1.1 Policy

A site Electrical Safety Program shall be established to ensure that employees and contractor employees who work with exposed, energized, or potentially energized electrical circuits and equipment are:

- Licensed (if applicable)
- Trained for the task being performed as well as trained in rules and requirements specific to Digital.
- Trained in emergency medical response (for example, first aid and CPR)
- Equipped with the appropriate tools and personal protective equipment

1.2 RESPONSIBILITIES

This subhead describes the responsibilities of the persons involved in fulfilling the requirements of this document.

- Site Manager

  Ensure that safety procedures for working on or near exposed electrical circuits are established and followed.

- Department Manager/Supervisor

  Ensure that all personnel working on or near exposed electrical circuits have been instructed in the hazards and operations of that equipment, are properly attired, and have the proper tools.

  Ensure that electrical devices are in safe operating condition through the implementation of an inspection program that includes such elements as equipment tests for current leakage and ground resistance as well as the development and maintenance of the associated documentation.

  Maintain clear and unobstructed access to electrical panels, switches, and controls in the work area.

- Maintenance and Engineering

  Ensure that electrical equipment, installations, and wiring are properly marked and identified, meeting the requirements of the applicable codes, and country and/or local regulations.

Perform electrical maintenance according to established safe work practices and procedures.

Post suitable signs and barricades in hazardous situations.

Ensure that lockout/tagout procedures are in place and adhered to.

- Site Environmental Health and Safety (EH&S)

  Support employee training.

  Approve tools and personal protective equipment.

  Assist Maintenance and Engineering by monitoring the electrical safety program.

- Employees and Contractor Employees

  Understand the hazards of electrical equipment before using it.

  Use appropriate tools and wear required personal protective equipment.

  Do not work alone in a hazardous environment. (See *EL-MF738-00, Working Alone.*)

  Understand and use the lockout/tagout procedure.(See *EL-MF744-00, Lockout /Tagout of Energy Sources.*)

  Do not use or permit the use of unsafe equipment.

1.3 LANGUAGE REQUIREMENT FOR THIS STANDARD

The details of this GIA standard and all documentation associated with it, such as manuals, training materials, signs, labels, postings, and so forth, must be available in English and the accepted and official local languages.

2 PROGRAM REQUIREMENTS

This subhead describes requirements for an electrical safety program.

2.1 AUTHORIZED EMPLOYEES

Electrical work must be conducted by authorized employees who are properly qualified. In certain cases, a license may be required.

2.2 WORKING ALONE

The degree of the hazard and the environment of the work will determine what precautions shall be taken, or whether an employee shall be permitted to work alone. Contact the site EH&S for clarification and/or permit(s) to work.

Fundamental rules that shall be adhered to by a backup person.

a. Know the potential hazards of the equipment on which the work is being performed and the location of the power shutoff(s).

b. Know how to rescue a person in distress without being put at risk.

c. Have appropriate rescue equipment available.

d. Shall have cardiopulmonary resuscitation (CPR) training.

2.3 LOCKOUT/TAGOUT OF ENERGY SOURCES

A lockout/tagout of energy sources program ensures that employees and contractor employees do not unknowingly attempt to energize equipment that has been taken out of operation for service and/or maintenance.

Supervisors shall supply a copy of the site lockout/tagout procedures and the required locks or tags.

Basic details of a lockout/tagout program are:

a. Communicate with all affected personnel before, during, and after de-energizing or energizing equipment. For off-shift work, contact security and/or supervision of the area where the work is being done.

b. Plan the shutdown so that equipment is fully isolated (for example, fuses are removed, breakers are rolled out, and so forth).

c. Verify and test the effectiveness of the isolation and lockout to ensure that the equipment is actually de-energized.

d. Remove locks and tags only after the work has been completed; only the person who applies a lock or tag is permitted to remove it.

e. Energize the equipment only after verifying that the area is clear, the affected users are notified, and the critical areas are being watched.

2.4 WARNING TECHNIQUES

There shall be appropriate signs and barricades to warn and protect employees from hazards that could cause injury from electric shock, burns, or failure of electrical equipment parts.

Mark circuit breaker boxes for contained voltages.

2.5 NOTICE OF SYSTEM CONDITION OR CONFIGURATION CHANGE

Notice of changes in the system condition or configuration shall be performed as indicated.

- Inform affected employees of system changes.
- Update safety and response plans.
- Keep building drawings up to date.
- Keep equipment manuals up to date.

2.6 FUNDAMENTAL GOOD WORK PRACTICES

All floors around high-voltage equipment shall be regarded as conductive unless covered with a wellmaintained nonconductive dry rubber mat approved for such use.

There shall be adequate work space clearance around electrical boxes, circuit breakers, and control panels.

Voltage Range	Work Space Clearance
0-150 volts to ground	36 inches in width and depth
151-600 volts to ground	48 inches in width and depth
Greater than 600 volts to ground	Minimum of 60 inches and greater as required by the most recent applicable country and/or local regulation or the National Fire Protection Association (NFPA) 70.

2.7 POTENTIAL PRESENCE OF SHOCK HAZARD

The primary means of protection is to prevent access to energized circuits.

- Lockouts, interlocks, nonconductive tools, grounding hooks, barriers, mats, and approved insulating leather or rubber gloves must be used as needed.

- Only authorized electricians shall be permitted to work on and be in the vicinity of exposed energized or potentially energized electrical circuitry.

- Do not handle electrical equipment while it is wet or while standing on a wet or damp floor.

- Persons working on energized or potentially energized electrical circuits shall not wear metal rings, watches, and bracelets.

- Where possible, ground fault interrupters (GFICs) shall be used on electrical circuits or equipment used in damp locations, and/or where work must be performed on energized circuits.

2.8 IDENTIFICATION REQUIRED FOR HAZARDOUS EQUIPMENT AND MOTOR CONTROLS

Hazardous equipment and motor controls shall have easily identifiable on and off switches, and in addition, shall have an easily accessible emergency shutoff switch.

All switches and circuit functions shall be clearly labeled.

Contained voltages shall be posted.

2.9 USE OF EXTENSION CORDS

Extension cords:

- Are for temporary use only.
- Shall not be used in place of permanent wiring.
- Must be heavy enough for the anticipated load and shall only be used singly.
- Shall not go through walls or be draped across ceilings, partition walls, or across floors.
- Shall be tested semiannually for continuity, especially the grounding connector.

2.10 OPERATION IN POTENTIALLY EXPLOSIVE ATMOSPHERES

Operation of electrical equipment shall be in accordance with the most recent applicable country and/or local regulation or the National Fire Protection Association (NFPA) 70.

- Use of flammable solvents, cleaners, or oil in an electrical environment shall be avoided or properly controlled.

2.11 POWER DISTRIBUTION SWITCHBOARDS

Power distribution switchboards shall have the following characteristics.

- Cover and panel plates must be securely replaced after the completion of work.
- Enclosing cabinets shall be designed to separate switches from wiring and locked against unauthorized entry. Facilities maintenance shall control access to the key.
- There shall not be open spaces that allow access to wiring.
- Contained voltages shall be posted.

2.12 GROUNDING

Grounding is required of all equipment with exposed metal parts and that operates at a voltage that presents a shock hazard.

Equipment shall be grounded through a grounding connector.

3 GENERAL ELECTRICAL SAFETY WORK PRACTICES

This subhead describes general electrical safety work practices.

3.1 SAFETY TRAINING

Authorized employees shall be trained in personal safety-related work practices and procedures that pertain to their job function.

Authorized employees shall only be permitted to work in areas and on equipment where they have been trained to recognize and avoid electrical hazards.

Licenses must be obtained where required.

3.2 PERSONAL PROTECTIVE EQUIPMENT

Authorized employees shall be provided with and use approved protective equipment specific to the potential hazards to which they may be exposed.

Protective equipment shall conform to applicable standards, shall be maintained in safe reliable conditions, and shall be periodically inspected to ensure functionality and condition of equipment.

Personal protective equipment shall be nonconductive.

3.3 WORKING ON DE-ENERGIZED CIRCUITS AND EQUIPMENT THAT MAY BECOME ENERGIZED

Follow lockout/tagout of energy sources procedures.

3.4 WORKING NEAR EXPOSED CIRCUITS AND EQUIPMENT THAT ARE OR MAY BECOME ENERGIZED

Instructions that detail the work content, sequence, potential hazards, and required safety measures shall be provided.

Illumination must be adequate before entering a space where there is energized equipment.

Conductive apparel shall not be worn where there is the potential for contact with exposed energized parts.

Where the use of conductive tools, materials, and equipment is required, they must be handled in a way to prevent accidental contact with exposed energized parts. Tools, materials, and equipment must be insulated and suitable for use where there is the potential for contact with exposed energized parts. Metal ladders shall not be used when working on or near exposed energized parts.

Barriers, shields, and/or insulating materials shall be used to protect employees from shock, burns, or other electrically induced injuries when working in proximity to exposed energized parts.

If a space is identified as a confined space, entry must be in accordance with site confined space entry procedures. Precautions must be taken to avoid inadvertent contact with exposed energized parts.

Precautions are necessary to prevent direct body contact or indirect body contact with overhead lines through contact with conductive materials or equipment. Where work is to be performed and contact with overhead lines is possible, the lines must be de-energized and guarded.

Safeguards must be in place when housekeeping and janitorial activities are performed in the proximity of exposed energized parts. In these situations, do not use conductive cleaning materials such as steam, water, and steel wool.

3.5 WORKING ON EXPOSED CIRCUITS AND EQUIPMENT THAT ARE ENERGIZED

Only authorized employees are permitted to work on exposed circuits and equipment that is energized.

Authorized Personnel shall be properly trained.

Proper personal protective equipment, insulated tools, and insulating shielded material shall be used.

3.6 SPECIFIC WORK PRACTICES REQUIRING SPECIAL SAFETY CONSIDERATION

These specific work practices require special safety considerations. Consult with site EH&S for applicable practices and requirements.

- Work involving test instruments on energized equipment
- Plant and equipment maintenance as well as service involving potentially hazardous energy sources
- Hi-Pot and ground continuity testing
- Electrostatic discharge operations
- Engineering power supply breadboard operations

APPENDIX A REFERENCED DOCUMENTS

A.1 EL-Class Digital Documents

EL-Class Number	Document Title
EL-MF738-00	*GIA Environmental Health and Safety Working Alone Standard*
EL-MF744-00	*GIA Environmental Health and Safety Lockout/Tagout of Energy Sources Standard*

Use VTX SMC to order copies of EL-class documents from Standards and Methods Control. Send distribution questions to JOKUR::SMC or call DTN: 234-4423.

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